MUSKOX SURVEY ON SOUTHWESTERN VICTORIA ISLAND, MARCH 1983

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MUSKOX SURVEY ON SOUTHWESTERN VICTORIA ISLAND, MARCH 1983

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ABSTRACT

A transect survey of muskoxen was carried out on southwestern Victoria Island between 26-27 March 1983. A total of 94 muskoxen in 10 herds were counted. Only 26 muskoxen were observed on transect and the resulting estimate for the area, 135 ± 51 (SD), is likely low. Herd size ranged from 2 to 45 and the mean density of muskoxen was 0.009 muskoxen/km^2. A total of 318 caribou were also observed during the survey. An estimate of 1290 ± 228 (SD) caribou, with a mean density of 0.09 caribou/km^2, is suggested for the area.

TABLE OF CONTENTS

ABSTRACT iii

LIST OF FIGURES vii

INTRODUCTION 1

METHODS 2

RESULTS 5

DISCUSSION 6

RECOMMENDATIONS 9

ACKNOWLEDGEMENTS 10

PERSONAL COMMUNICATIONS 11

LITERATURE CITED 12

APPENDIX A. Number of muskoxen observed on southwestern Victoria Island, March 1983 13

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LIST OF FIGURES

Figure 1. Location of muskox herds and transect lines on southwestern Victoria Island, 26-27 March, 1983 3

INTRODUCTION

Information on historical muskox distribution on southwestern Victoria Island is sparse (Urquhart 1982). Numbers over the entire island were believed to be quite low during the early and mid part of this century (Anderson 1930, Macpherson 1961).

Recent surveys have indicated an expanding population over much of Victoria Island (Jakimchuk and Carruthers 1980, Jingfors 1984, 1985). However, little attention has been given to the southwestern portion of the island.

It is likely that some muskoxen have been harvested in the past by the outpost camps located on southwestern Victoria Island (Jingfors 1983). It was, therefore, necessary to determine the abundance and distribution of muskoxen in the area for management purposes. As a result of additional funds made available from the Northern Oil and Gas Activity Program (NOGAP), a systematic survey over portions of southwestern Victoria Island was flown in March 1983. This report describes the results of that survey.

METHODS

A systematic transect survey of muskoxen was flown 26-27 March 1983 over portions of southwestern Victoria Island from Richardson Islands in the east, to Lady Richardson Bay on the Wollaston Peninsula in the west, and north to approximately 69°30'N latitude (Fig. 1). The area was divided a priori into two strata to obtain roughly equal transect lengths within each stratum and, therefore, to reduce variance.

A Helio Courier aircraft on wheel/skis was used to fly transect lines oriented in a north-south direction. The transect lines were 3.0 km wide (1.5 km on each side of the plane) and were spaced at 15 km intervals. The strip width was determined by the formulae given by Norton-Griffiths (1978), where the bottom of the window was used as the inner-most edge of the transect, and a piece of doweling tied to wiring stretched from the wing to the fuselage was used as the outer boundary. Transects were flown at an altitude of 300 m agl and at an airspeed of 160-170 kph. Transect width was initially checked against the known length of the Coppermine airstrip on takeoff.

The two observers in the rear of the plane counted muskoxen as either on or off transect. The pilot navigated and marked the location of observations on 1:250,000 NTS topographic maps. The person in the front right seat recorded the sightings. The front seat observer and pilot assisted in spotting groups and counting animals. While the survey was intended for muskoxen, observations of caribou were also recorded.

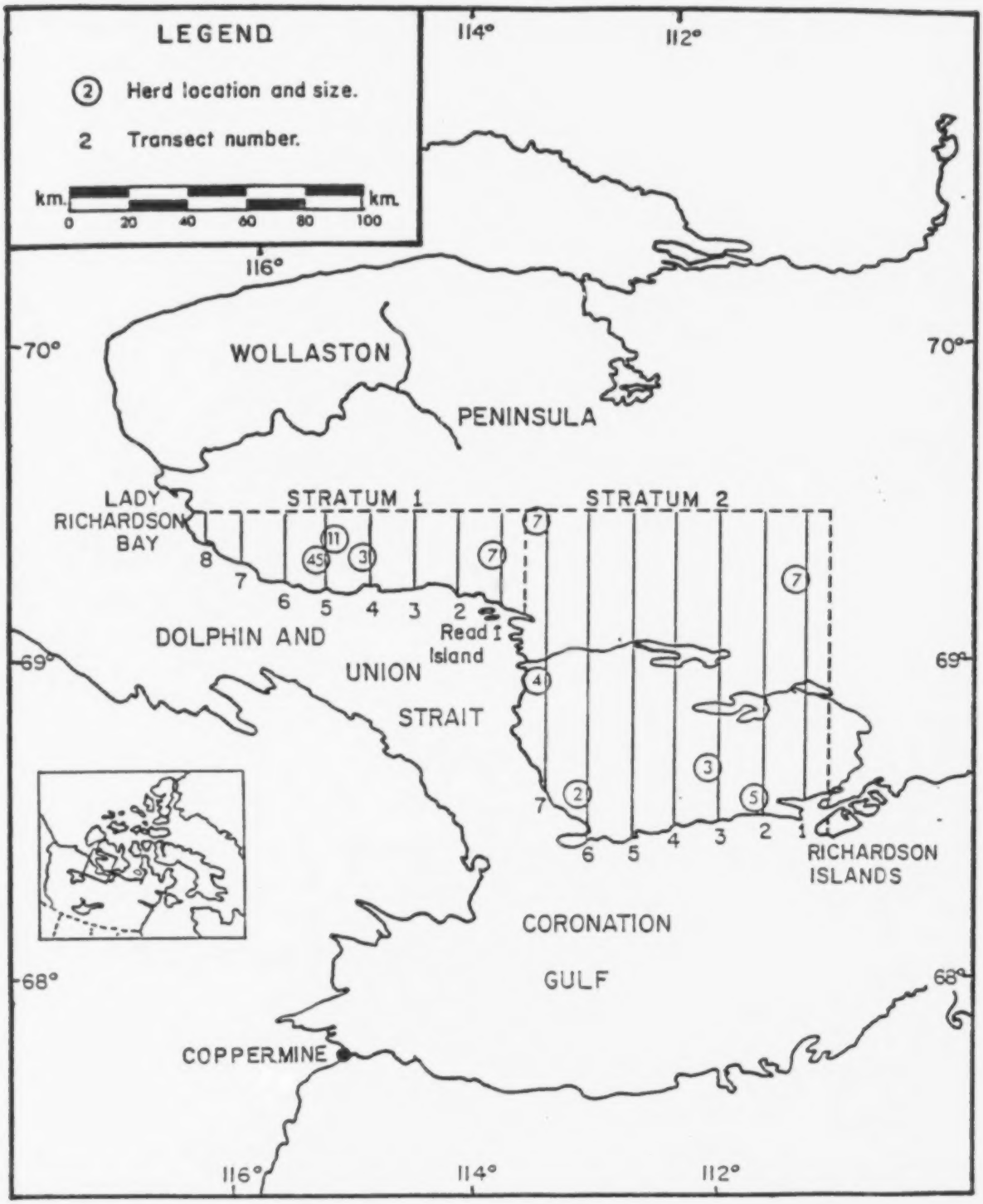

Figure 1. Location of muskox herds and transect lines on southwestern Victoria Island, 26-27 March, 1983.

An Apple II plus micro-computer was utilized for data analysis. Survey area was calculated from a graphics tablet program, while survey results were analyzed using a census data program based on Jolly's Method 2 (Jolly 1969).

RESULTS

A total of 11.5 hours were flown, 6.5 hours on transect, on 26 and 27 March. Fifteen transects were flown over 963.25 km, representing a coverage of 19.5% (2890 km^2) of the entire study area (14,826 km^2). Visibility was good to excellent during the survey.

A total of 94 muskoxen in 10 groups were counted (Fig. 1, Appendix A). A relatively low proportion of the animals (N=26) were seen on transect as a result of one large herd (45 muskoxen) sighted off transect, northwest of Read Island (Fig. 1). The population estimate for the survey area was 135 ± 51 (SD), representing a mean density of 0.009 muskoxen/km^2. The coefficient of variation (C.V.) was 0.38.

The range in herd size was 2-45 and the mean 10.4 ± 13.4 (SD). Excluding the herd of 45 animals the mean herd size was 6.1 ± 3.5 (SD). We did not attempt to classify any of the animals located.

Muskoxen were sparsely and unevenly distributed throughout most of the survey area. However, stratum 2 on the Wollaston Peninsula had a higher density of muskoxen than stratum 1 (0.034/km^2 versus 0.002/km^2).

Although the survey was intended specifically for muskoxen, caribou were also counted. A total of 318 caribou were located, 252 on transect and 66 off transect. The estimated population for the two strata was 1290 ± 228 (SD). A relatively uniform distribution of animals in stratum 1 resulted in a coefficient of variation of 0.18. Due to altitude and transect width, it is possible that some caribou were missed.

DISCUSSION

Only two surveys of muskoxen have previously been undertaken on southwestern Victoria Island. In August 1980, Jakimchuk and Carruthers (1980) carried out a stratified transect survey of the entire Victoria Island. The present survey covered only about 35% of their stratum C, which was surveyed at 6.35% coverage and included all of Wollaston Peninsula and the east side of Prince Albert Sound. Jakimchuk and Carruthers (1980) estimated 896 ± 387 (SD) muskoxen in their stratum C, with most sightings concentrated at the head of Prince Albert Sound. Only one lone muskox was located in the present study area.

A reconnaissance-type survey was carried out on southwestern Victoria Island in July 1982 by Decker (pers. comm.). A total of 61 muskoxen were counted within the present study area; all were within a short distance of the coast where the search effort was concentrated.

Muskoxen appear to be sparsely distributed over southwestern Victoria Island. Due to differences in timing and survey design of previous surveys, it is difficult to determine a population trend for the area. At present, the muskox numbers appear to be relatively stable or slightly increasing.

The present density of 0.009 muskoxen/km^2 on southwestern Victoria Island is significantly less than the density of 0.08 muskoxen/km^2 estimated for both southeastern Victoria Island in March 1983, and the northwestern portion of the island in August 1983 (Jingfors 1984, 1985). The reason for these differences is not altogether clear. The physiography of most of

the survey area (stratum 1) is similar to that found in the southeastern portion of the island - Eastern Lowland (Jacobson 1980). Vegetation may play an important role in muskox distribution.

> ...the eastern and southeastern part of the island seem lush, with an abundance of sedge meadows. The Wollaston and Prince Albert Peninsulas exhibit numerous but small sedge meadows on lowland depressions. Hillsides are more sparsely vegetated there than those in the southeast. (Jacobson 1980:7).

Climatic differences that would influence differences in muskox densities between the survey area and the remainder of the island are not apparent (Maxwell 1980). The annual mean daily temperature for southwestern Victoria Island is actually greater than those encountered on the eastern portion of the island. Depth of maximum snow cover is similar to northwestern Victoria Island.

It is possible that the "carrying capacity" of muskoxen on southwestern Victoria Island, while ultimately less than other locations on the island, is greater than the densities presently observed. For various reasons, muskox numbers in the area may be slow to return to historical levels. Conservative harvest levels will encourage repopulation to historical levels.

The estimate from the present survey (135) is likely an underestimate for the area. Ninety-four muskoxen were observed and only 26 were on transect. The estimate is only 1.4 times the number actually seen. As muskoxen are readily visible up to 3 km from the aircraft, 40-50% of the area was effectively covered. Therefore, 135 is likely an underestimate.

Muskoxen were extremely visible, showing up well on the white background. I am confident that most, if not all muskoxen located within 3 km of the aircraft were detected.

Jakimchuk and Carruthers (1980) estimated that there were 1440 ± 258 (SD) caribou on southwestern Victoria Island (stratum C). Most animals were located on the lowlands at the head of Prince Albert Sound. The present estimate of 1290 ± 228 (SD) for the survey area could represent a substantial increase in caribou numbers for this portion of the island, realizing the limitations of seasonal differences in distribution.

RECOMMENDATIONS

Although muskox numbers on southwestern Victoria Island are relatively low, there appears to be sufficient animals present, on a year-round basis, to justify the establishment of a conservative quota to be utilized by residents of the Read Island outpost camp. I, therefore, concur with Jingfors (1983) that a management area be created and a quota of 5 muskoxen be given to the Coppermine HTA for distribution to the outpost camp.

An increase in transect width for muskoxen should be considered in future surveys in relatively flat terrain, such as that encountered on southwestern Victoria Island. Wider transects will increase coverage of an area and/or enable larger areas to be surveyed.

ACKNOWLEDGEMENTS

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PERSONAL COMMUNICATIONS

Decker, R. A.L.U.R. Technician, Department of Renewable Resources, Yellowknife.

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Appendix A. Number of muskoxen observed on southwestern Victoria Island, March 1983.

Transect number	Transect area (km^2)	On transect		Off transect	
		left	right	left	right
Stratum 1					
1	307.0	0	0	0	7
2	318	0	0	0	5
3	327	0	3	0	0
4	334.5	0	0	0	0
5	345	0	0	0	0
6	346.5	2	0	0	0
7	296.25	0	0	7	4
Stratum 2					
1	103.5	7	0	0	0
2	89.25	0	0	0	0
3	81	0	0	0	0
4	84	0	3	0	0
5	87	0	11	45	0
6	77.25	0	0	0	0
7	59.25	0	0	0	0
8	33.75	0	0	0	0
Total	2889.75	9	17	52	16

Total Strata area - 14,826 km^2

(Stratum 1 - 11,628 km^2, Statum 2 - 3198 km^2).